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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/074,514	02/12/2002	John R. Noll	6785-217US	6744

39207 7590 05/06/2005

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EXAMINER

PEREZ, JULIO R

ART UNIT PAPER NUMBER

2681

DATE MAILED: 05/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/074,514	NOLL ET AL.	
	Examiner	Art Unit	
	Julio R Perez	2681	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments with respect to claims 1-14 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bongfeldt (Pub. No. 20020045431) in view of Ma (Pat. No. 6801514).

Regarding claim 1, Bongfeldt discloses a wireless communication system with a plurality of base stations communicating indirectly with a plurality of wireless communications devices through a plurality of repeaters, a method for more efficient use of radio spectrum, comprising: communicating indirectly between a first base station and a wireless communication device using a first repeater and a first RF backhaul link (page 3, pars. 0034, 0037-0038; Fig. 1).

Fig. 1 of Bongfeldt shows a system that includes a base station, a repeater and a wireless communication device as recited in claim 1 except that the base station includes a directional antenna as opposed to a smart antenna, as recited in the claim. See page 7, pars 0080-0081 for the teaching that the so-called "smart" antenna may be used in different situations in order to avoid interference. Ma discloses a system that

provides spatial division multiple access including a smart antenna on a plurality of base transceiver stations, Figures 3-5; col. 3, lines 14-64; col. 4, lines 35-57, thereby teaching that an adaptive array antenna, also known as smart antenna are art recognized.

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify the base station of Bongfeldt such that it accommodates an adaptive array antenna, such as the smart antenna disclosed by Ma. One would have been motivated to make such a modification in view of the suggestion in Ma that it is possible to maintain high call quality and reducing interference, thereby contributing to an increase in call capacity. Furthermore, the smart antenna can automatically change its radiation beam pattern in response to a predetermined signal environment, and which arranges a plurality of antenna elements in a specific form and multiplying an output of each antenna element by a complex weight, thereby forming an antenna RF backhaul in the direction of a first repeater.

Regarding claims 2 and 9, the combination of Bongfeldt and Ma disclose, further wherein said communicating step further comprises said first base station communicating with a second wireless communication device using said second repeater and said second RF backhaul link (Bongfeldt, page 3, pars. 0034, 0037-0038; Fig. 1).

Regarding claims 3 and 10, the combination of Bongfeldt and Ma disclose, wherein said second repeater communicates with a second base station located in a communication cell separate from said first base station (Bongfeldt, page 3, pars. 0034, 0037-0038; Fig. 1).

Regarding claims 4 and 11, the combination of Bongfeldt and Ma disclose further comprising selectively controlling a second smart antenna system of said second base station for improved spectral efficiency by selectively configuring said second smart antenna system to spatially isolate communications on said second RF backhaul link from communications on said first RF backhaul link (Ma, Figures 3-5; col. 3, lines 14-64; col. 4, lines 35-57).

Regarding claim 8, Bongfeldt discloses a wireless communication system with a plurality of base stations communicating indirectly with a plurality of wireless communications devices through a plurality of repeaters, a system for providing more efficient use of radio spectrum, comprising: a first base station configured for communicating indirectly with a wireless communication device using a first repeater and a first RF backhaul link (page 3, pars. 0034, 0037-0038; Fig. 1)

Fig. 1 of Bongfeldt shows a system that includes a base station, a repeater and a wireless communication device as recited in claim 1 except that the base station includes a directional antenna as opposed to a smart antenna, as recited in the claim. See page 7, pars 0080-0081 for the teaching that the so-called "smart" antenna may be used in different situations in order to avoid interference. Ma discloses a system that provides spatial division multiple access including a smart antenna on a plurality of base transceiver stations, Figures 3-5; col. 3, lines 14-64; col. 4, lines 35-57, thereby teaching that an adaptive array antenna, also known as smart antenna are art recognized.

Therefore, it would have been obvious to one having skill in the art at the time the invention was made to modify the base station of Bongfeldt such that it accommodates

Art Unit: 2681

an adaptive array antenna, such as the smart antenna disclosed by Ma. One would have been motivated to make such a modification in view of the suggestion in Ma that it is possible to maintain high call quality and reducing interference, thereby contributing to an increase in call capacity. Furthermore, the smart antenna can automatically change its radiation beam pattern in response to a predetermined signal environment, and which arranges a plurality of antenna elements in a specific form and multiplying an output of each antenna element by a complex weight, thereby forming an antenna RF backhaul in the direction of a first repeater.

4. Claims 5-7, 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bongfeldt in view of Ma as applied to claim 1 above, and further in view of Dean et al. (5771017).

Regarding claims 5, 12, the method of Bongfeldt as modified in view of Ma above includes all that is recited in claims 5 and 8 except for controlling the selecting from an antenna array at least one antenna element for use by said first base station in producing a directional antenna pattern having a major lobe in the direction of said first repeater. The concept of selecting an element on an array antenna to be pointing in a directional pattern with its main lobe towards a specified device is well known in the art. See column 5, lines 17-37; col. 8, lines 32-62; Figures 6a-6b, of Dean.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the array antenna mounted on the base station of Ma so as to include means to produce narrower beam widths as per the

Art Unit: 2681

teachings of Dean, so that that adaptive array may radiate using selected narrow beams towards specific repeaters.

Regarding claims 6, 13, the combination of Bongfeldt, Ma and Dean disclose further comprises selecting a plurality of antenna elements from said antenna array for use by said first base station and adjusting at least one of a phase and amplitude of RF signals received and transmitted by said plurality of antenna elements to produce said directional antenna pattern (Dean, col. 5, lines 25-37; col. 8, lines 32-62).

Regarding claims 7, 14, the combination of Bongfeldt, Ma and Dean disclose further comprises selecting a plurality of antenna elements from said antenna array for use by said base station and adjusting at least one of a phase and amplitude of RF signals received and transmitted by said plurality of antenna elements to produce a null in said directional antenna pattern, said null selectively directed toward said second repeater (Dean, col.5, lines 25-37; col. 8, lines 32-62; col. 9, lines 1-14).

Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the art with respect to base stations with adaptive array antennas and repeaters to maximize system performance.

US Pub. No. 20020013164 to Leifer et al.

Null deeping for adaptive
antennas

US Pub. No. 20050059342 to Engels et al.

Wireless cellular network

US Pub. No. 2020187813 to Guo

Smart Antenna Arrays

Art Unit: 2681

US Pub. No. 20020193147 to Li et al.

Distributed smart antenna
system


US Pat. No. 6049315 to Meyer

Repeater isolation via
antenna diversity

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julio R Perez whose telephone number is (703) 305-8637. The examiner can normally be reached on 7:00 - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Emmanuel Moise can be reached on 703-306-0003. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


JP
4/30/05


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